REMARKS

The Claim Amendments

Applicants have amended claim 1 to recite that the polypeptide consists of "the amino acid sequence from Met at position 1 to Arg at position 1057 of SEQ ID NO: 2 or an amino acid sequence with at least 80% homology to SEQ ID NO: 2, wherein a plant which has a defect in said polynucleotide exhibits dwarfism, upright form, and malformation of grain hulls." Support for this amendment may be found, e.g., in original claim 1; on page 6, lines 17 – 26; and on page 7, lines 9 – 20.

Applicants have added claims 12 – 16. Support for added claims 12 – 16 may be found in the specification (*see, e.g.*, page 6, line 17 to page 7, line 20; page 13, lines 14 – 21; and page 13, line 31 to page 14, line 10).

None of these amendments adds new matter. Their entry is requested. After entry of the amendments, claims 1 and 12 – 16 will be pending.

The Rejection under 35 U.S.C. § 101

The Examiner has rejected former claim 1 under 35 U.S.C. § 101, as lacking either a substantial asserted utility or a well established utility. The Examiner acknowledges that the specification provides evidence of a causative relationship between the presence of a mutated form of the claimed polynucleotide and an altered response to brassinosteroid hormone. However, the Examiner states that it is not clear what one would actually use the claimed nucleic acids to accomplish.

The Examiner states that Altmann, Current Opinion in Plant Biology, 1998, Vol. 1, page 378 – 83 ("Altmann") teaches that plants that are insensitive to brassinosteroids may be blocked at any number of positions in a complicated pathway. The Examiner asserts that functionality in any one of these capacities would have an effect on how and

when the instant polynucleotides would be useful. The Examiner states that the creation of dwarf plants is not an asserted utility in the specification and that this utility is first mentioned in applicants' May 21, 2003 Response. The Examiner further contends that methods of cosuppression are highly unpredictable and states that the specification does not provide any demonstration that co-suppression can be achieved using the nucleic acid molecule of claim 1. In the Examiner's view, the specification does not reasonably confirm that the polynucleotide is useful to manipulate the brassinosteroid pathway either for growth enhancement or to create dwarf plants. Applicants traverse.

First, applicants disagree with the Examiner's statement that the creation of dwarf plants is not an asserted utility in the specification. The specification states that the invention provides a "polynucleotide encoding a plant gene capable of controlling various effects in which brassinosteroid is involved . . . including dwarfism . . . " (page 6, lines 18 – 25) and that "[b]y introducing the present polynucleotide into plants . . . effects such as growth promotion . . . can be controlled" (page 14, lines 1-7). Thus, the specification clearly asserts that the polynucleotides of the invention can be used to control growth promotion, e.g., to create dwarf plants.

Second, the specification discloses that plants lacking the claimed polynucleotide exhibited dwarfism, upright form, and malformation of grain hulls (page 10, lines 15 – 21) and that they are brassinosteroid insensitive (page 12, line 34 to page 13, line 24). Thus, one of ordinary skill in the art would reasonably expect plants genetically engineered to have a defect in this polynucleotide to exhibit these phenotypes. Further, each of amended claims 1 and added claims 12 – 16 recites that a plant with a defect in the

claimed polynucleotide exhibits either dwarfism, upright form, and malformation of grain hulls or brassinosteroid insensitivity. Furthermore, reliable methods to inhibit the expression of genes in plants, including co-suppression and antisense were part of the state of the art at the time the instant application was filed. These methods are described in, e.g., United States Patent 5,034,323 and International Patent Application WO 90/12084 (co-suppression) and United States Patent 5,107,064 (antisense). It is well settled that a patent need not teach, and preferably omits, what is well known in the art. See MPEP 2164.01. Thus, one of skill in the art would recognize that the claimed polynucleotides can be used to create plants that exhibit these phenotypes using, for example, co-suppression or antisense methods to create a defect in the corresponding genes by inhibiting their expression.

Furthermore, applicants' demonstration that plants lacking the claimed polynucleotides exhibit these phenotypes obviates the Examiner's citation of Altmann. Applicants need not show where the polypeptides are involved in the brassinosteroid signal-transduction pathway — the showing that they are and can be used to alter brassinosteroid responses is sufficient to satisfy the requirement of 35 U.S.C. § 101. *See, e.g., Newman* v. *Quigg*, 877 F.2d 1575, 1581, 11 USPQ2d 1340, 1345 (Fed. Cir. 1989) ("[I]t is not a requirement of patentability that an inventor correctly set forth, or even know, how or why the invention works."); *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1469 (Fed. Cir. 1999) ("[S]tatements that a physiological phenomenon was observed are not inherently suspect simply because the underlying basis for the observation cannot be predicted or explained.").

Accordingly, the invention recited in pending claims 1 and 12 – 16 has a specific, substantial and credible utility and the rejection should be withdrawn.

The Rejection under 35 U.S.C. § 112, First Paragraph

The Examiner has rejected former claim 1 under 35 U.S.C. 112, first paragraph, as lacking either a substantial asserted utility or a well established utility. The Examiner states that one skilled in the art would not know how to use the claimed invention and that undue experimentation would be required to use the invention. Applicants traverse.

As described above, the polynucleotides of the present invention can be used to produce a plant that has a defect in said polynucleotide and that such a plant would exhibit dwarfism, upright form, and malformation of grain hulls and/or be brassinosteroid insensitive. Furthermore, the well known co-suppression and antisense methods may be used to produce such a plant using the polynucleotides of the invention. Finally, contrary to the Examiner's assertion, these methods are not highly unpredictable. Where the phenotypic result of a defect in a particular gene is known — as is the case here — plants genetically engineered according to co-suppression or antisense methods are routinely screened to identify plants with the desired phenotypic trait(s) (*see, e.g.*, United States Patents 5,034,323 and 5,107,064). At the time of the filing of the instant application and the corresponding priority application, the screening of such plants using these methods was no more unpredictable than the screening of monoclonal antibodies in *In re Wands*, 858 F.2d 731, 205 USPQ 559 (Fed. Cir. 1986). Accordingly, one of ordinary skill in the art could use

the claimed polynucleotides to genetically engineer plants with the desired phenotypes with no more than routine experimentation.

Conclusion

For the reasons presented above, applicants request that the Examiner allow claims 1 and 12 – 16 to issue.

Respectfully submitted,

James F. Haley, Jr. (Reg. No. 27,794)
Stanley D. Liang (Reg. No. 43,753)
Attorneys for Applicants
Grant Kalinowski (Reg. No. 48,314)
Agent for Applicant

FISH & NEAVE
Customer No. 1473
1251 Avenue of the Americas
New York, New York 10020-1105
Tel.: (212) 596-9000
Fax: (212) 596-9090